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It is concluded that if methane were the sole explosive gas, only local explosions near the face of the coal could result. Coal dust is present, however, in large quantities and can under proper conditions become explosive. The chief restraining agent on dust explosion is dampness, and the presence of a high proportion of non-combustible shale dust. A great reduction of the moisture in mine atmospheres results from the incoming of cold air at the beginning of winter, and it is observed that most of the great explosions have been at that time.

It is a general belief that old dust exposed for a long time to the air is more dangerous than fresh dust, but the author shows by experiment that this belief is erroneous, and that fresh dust is the more explosive.

E. R. L.

Reconnaissance of the Book Cliffs Coal Field between Grand River, Colorado, and Sunnyside, Utah. By G. B. RICHARDSON. U.S. Geol. Surv. Bulletin 371.

The field forms a part of the south rim of the Uinta basin, around whose margin the outcrops of coal-bearing rocks can be traced for more than five hundred miles. Three formations of Cretaceous rocks are mapped: the Dakota sandstone lying unconformably on Morrison beds, the Mancos shale of Colorado and Montana age, and the Mesaverde formation which is overlain unconformably by Wasatch beds. The Mesaverde is partly marine and partly non-marine, the marine part showing close similarity to the upper Mancos shale and the non-marine to the Laramie. The age is placed as pre-Laramie, the Laramie epoch being supposedly represented by the unconformity above.

Coal of good quality occurs in the lower part of the Mesaverde formation in some localities. Several beds are present, but no single bed has been traced for more than a few miles. The coal of the region is little developed.

E. R. L.

Cenozoic Mammal Horizons of Western North America. By HENRY FAIRFIELD OSBORN, with *Faunal Lists of the Tertiary Mammalia of the West* by WILLIAM DILLER MATTHEW. U.S. Geol. Surv. Bulletin 361.

This report is primarily a correlation of the mammal-bearing horizons of the Cenozoic with one another and with those of Europe, with a brief characterization of each horizon. In the Tertiary, six faunal phases are

recognized, containing eighteen subdivisions, while a seventh phase belongs to the Pleistocene. Three faunal phases containing seven subdivisions belong to the Eocene, the fourth phase, containing seven subdivisions, extends through the lower Miocene, the fifth phase extends through the middle and upper Miocene, and the sixth through the Pliocene. The conclusion is that North America promises to give a nearly complete and unbroken history of the Tertiary in certain regions, though much work still remains to be done. The chief remaining gap is now in the Pliocene stratigraphy.

E. R. L.